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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,756	11/30/2000	Hideyo Makino	199892US2	1614

22850 7590 12/08/2003

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EXAMINER	
PHAM, HAI CHI	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/725,756	MAKINO, HIDEYO	
	Examiner	Art Unit	
	Hai C Pham	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *RCE (10/22/03) & Amendment (08/29/03)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,6,8,22,26,28 and 41-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,6,8,22,26,28 and 41-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 10/22/03 for a Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/725,756 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2, 6, 8, 22, 26, 28, 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima (JP 9-236763) in view of Yamaguchi (U.S. 6,133,566) and Iwasa et al. (U.S. 6,144,685).

Nakajima discloses a multibeam scanning device having a plurality of semiconductor laser arrays (10, 11) with corresponding collimator lenses (12, 13), and an adjusting means rotating each of the semiconductor laser arrays around a midpoint (M) of a line connecting the centers of the light emitting points, and around the optical axis of the collimator lens (12) (see Figs. 2 and 4). Nakajima ('763) further discloses a plurality of corresponding holders (23, 24, 25, Fig. 3) for holding the semiconductor laser arrays and the collimator lenses, the holders include through-holes for

accommodating the semiconductors lasers and flanges (25a, 25b, Fig. 3) for securing the respective collimator lenses such that an optical axis of the respective collimator lens coincides with a midpoint between the plurality of light emitting points of the respective semiconductor laser arrays (Figs. 2, 3).

However, Nakajima does not explicitly disclose the semiconductor array having four light-emitting points positioned at an equidistant pitch.

However, it is well known in the printing art that higher number of light emitting points are commonly used to scan the surface of the photosensitive member as evidenced by Yamaguchi, which discloses a multiple beam scanning apparatus comprising a plurality of semiconductor laser arrays as light sources (2_1-2_M, Fig. 1), each including more than two light emitting points (five light emitting points as shown in Figs. 5-6) positioned in linear relationship to one another and having an equidistant pitch so as to respectively emit laser beams simultaneously scanned over a recording substrate (photosensitive drum 8). Yamaguchi further teaches the provision of respective collimator lenses (3_1-3_M) each of the optical axis of which is aligned with the midpoint the plurality of light emitting points of the respective semiconductor laser arrays (Fig. 17).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a semiconductor array having more than two light-emitting points as taught by Yamaguchi in the device of Nakajima. The motivation for doing so would have been to provide a higher speed to the printing device where a plurality of scanning lines can be formed simultaneously.

Nakajima also does not expressly teach the claimed relationship:

$\theta \leq \tan^{-1} \{1/(n-1)\}$.

Regardless, Iwasa et al. discloses a multibeam recording apparatus in which the laser source array is arranged such that the laser beam spots on the surface of the recording medium are aligned (inclined line M', Fig. 7A) in the sub-scanning direction, and are inclined with respect to the main scanning direction (base line N') to form an angle θ' with the main scanning line. The disposition of the laser beam spots on the recording medium as well as the angle θ' are image of the corresponding structure of the laser source array, and result from a predetermined magnification. Table 2 (col. 11) shows the parameters of the multibeam recording apparatus in its basic configuration, where:

$m = 30$ (m is the number of laser beam spots in the sub-scanning direction)

$\theta = \theta' = 88.1°$

The angle formed by the line drawn perpendicular to the primary (main) scanning direction and the line drawn through respective centers of the first to the m-th laser beam spots becomes:

$90° - \theta' = 90° - 88.1° = 1.8°$

and the value of

$\tan^{-1} \{1/(m-1)\} = \tan^{-1} \{1/(30-1)\} = 1.97°$

Therefore,

$90° - \theta' \leq \tan\text{-}1 \{1/(m-1)\}$

which amply satisfies the claimed inequality.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Nakajima with the aforementioned teachings of Iwasa et al. for the purpose of adjusting the pitch of the scanning lines.

Response to Arguments

4. Applicant's arguments filed 08/29/03 have been fully considered but they are not persuasive.

5. Contrary to Applicant's arguments concerning Nakajima ('763) that "does not teach or suggest the claimed holder including the through-hole and flange", Nakajima shows in Fig. 3 a holding unit, which includes the laser holders (23, 24) for holding the respective semiconductor laser arrays (10, 11) in the respective through-holes of the laser holders, the through-holes of the laser holders being aligned with the through-holes of the lens holder (25), which has flanges (25a, 25b) for securing the respective collimator lenses (12, 13) such that the optical axis of each of the collimator lenses are coincided with the midpoint between the plural light emitting points of each of the semiconductor laser arrays (Fig. 4).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin R. Fuller can be reached on (703) 308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

HAI PHAM
PRIMARY EXAMINER
November 26, 2003